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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 13

Application Number: 09/262,530
Filing Date: March 04, 1999
Appellant(s): PICCIRILLI, ALFONSO B.

Joseph B. Ryan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/27/03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

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(2) Related Appeals and Interferences

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(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

The appellant's statement of the issues in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1, 2, 7, and 9 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims 15 and 20 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims s 28 and 31 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims 3, 8, 12-14, 25, and 27 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

Appellant's brief includes a statement that claims 22, 3, 8, 12-14, 25, and 27 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

The rejection of claims 4-6, 17-19, 23, 24, 29, and 30 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims 21 and 32 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,710,650	Dugan	1-1998
6,256,124	Hait	7-2001
6,160,651	Chang et al.	12-2000

Norte, D. "All-Optical TDM-to-WDM Data Format Conversion in a Dynamically Reconfigurable WDM Network" IEEE Photonics Technology Letters, Vol. 7 No. 8 (August 1995), pp. 920-922 (hereafter Norte I)

Norte, D. "Demonstration of an All-Optical Data Format Transparent WDM-to-TDM Network Node with Extinction Ratio Enhancement for Reconfigurable WDM Networks" IEEE Photonics Technology Letters, Vol. 8 No. 5 (May 1996), pp. 715-721 (hereafter Norte II)

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 7, 9, 15, 20, 28, and 31 rejected under 35 U.S.C. 102(b). This rejection is set forth in prior Office Action, Paper No. 8.

Claims 3, 8, 12-14, 16, 22, 25, and 27 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

Claims 4-6, 17-19, 23, 24, 29, and 30 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

Claim 10 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

Claim 11 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

Claims 21 and 32 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

Claim 26 rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 8.

(11) Response to Argument

Regarding applicant's **Issue 1**, the applicant argues that the Dugan reference fails to specifically teach:

a) assigning distinct portions of the data signal to two or more respective channels

b) for each channel, using corresponding assigned portions of the data signal to modulate an optical carrier at a respective wavelength associated with that channel

The applicant provides support for this argument by stating that division of a high-speed signal into a plurality of lower-speed signals to two or more respective channels, as taught by Dugan, is not the same or not equivalent to assigning distinct portions of a data signal to two or more respective channels as claimed. The applicant further argues that the lower-speed streams

do not constitute actual portions of the high-speed data stream in that the lower-speed streams are separate and distinct apart from the high-speed signal, based on the fact that lower-speed signals operate at a lower bit rate than the higher-speed signal.

The examiner disagrees with the applicant's interpretation of Dugan. It is clear that Dugan meets the limitations of the claimed invention in that Dugan specifically teaches that a high-speed data stream is *partitioned* into a plurality of lower-speed data streams along an associated plurality of separate wavelength channels (abstract). It is clear that the lower-speed streams do indeed constitute actual portions of the high-speed data stream in that the lower-speed signals are created by apportioning the same exact data bits in the high-speed data stream into the lower-speed data streams. New data bits were not used to create the lower rate data streams nor did the data bits spontaneously appear in the form of low rate data streams. Instead, the data bits in the lower-speed data stream are the same bits that originated in the high-speed data stream. Furthermore, the high-speed data stream is divided into equal portions of low-speed data streams. Here, an OC-192 signal (~10Gbps) is divided into four equal OC-48 signals (~2.5 Gbps), thereby proving that distinct portions of the high-speed data signal (e.g. portions taken in 2.5Gbps intervals) are assigned to distinct wavelength channels. The fact that the lower-speed data signals operate at a lower speed in comparison to the high-speed signal does not detract the fact that the bits contained within the lower-speed signals are same bits that originated in the high-speed signal. To say that the lower-speed signals are not actual portions of the high-speed signal would be like saying that two equal portions of a sliced sandwich are not actual portions of the original unsliced sandwich. Of course the opposite is true since the sliced portions contain the exact same ingredients of the original sandwich, only in a smaller portion. Accordingly, it is

clear that Dugan does indeed teach assigning distinct portions of the data signal to two or more respective channels and further that the assigned portions of the data signal modulate an optical carrier at a respective wavelength associated with that channel (reference numeral 42 in Figure 1).

Applicant, in regard to claims 15, 28, and 31, argues that Dugan fails to specifically teach that different portions of a received optical signal are assembled, from distinct wavelength channels, into a single sequential data stream. However, it is clear that Dugan does teach this limitation in that Dugan provides a receiver wherein a multiplexed signal is divided into distinct wavelength OC-48 portions based on wavelength (e.g. via the wavelength division demultiplexer reference numeral 56 in Figure 2), then assembles theses portions back into the original OC-192 data signal (column 3 lines 9-16), thereby producing a sequential data stream from the portions of the data stream received.

Regarding applicant's **Issue 2**, the applicant argues that the 103(a) rejection of claim 22 is improper since the Hait fails to remedy the deficiencies in Dugan assumed by the applicant. However, as proven above, it is clear that the Dugan reference is not deficient and clearly meets the claimed limitations. Therefore, applicant's argument regarding claim 22 is moot.

The applicant further argues, with regard to claim 3, that the combination of Dugan and Hait fails to specifically teach allocation of a recurring time window to a particular channel, the recurring time window identifying the particular portions of a given signal that will be assigned to the channel. However, Dugan suggests the use of timing circuits to accommodate timing issues (reference numeral 24, 38 in Figure 1, column 5 lines 15-18, column 6 lines 22-25,

column 7 lines 3-6), while Hait teaches the use of delays allowing a modulated digit to arrive at an output a its assigned digit time (e.g. time window, column 2 lines 18-25, column 4 lines 33-50, column 5 lines 1-11, 26-31). Furthermore, Hait clearly teaches the use of a recurring time window wherein bits are allocated. As seen in Figure 2, Hait shows that bits in streams 30-34 are joined according to a specific time window in which they fall (e.g. bits 38 that fall within time window 41 are combined). As Figure 2 clearly shows, the use of recurring time windows to gather bits that fall within that time window is well known. Furthermore, one skilled in the art would clearly have recognized that it would have been possible to allocate a recurring time window to a particular channel, the particular channel being one of the channels taught by Dugan. For example, window 41 of Figure 2 in Hait could have been allocated to one of Dugan channels, and the bits of the input OC-192 stream of Dugan that fell within that time window would have been placed on the channel. Meanwhile window 44 of Figure 2 in Hait could have been allocated to another of Dugan's channels, and the bits of the input OC-192 stream of Dugan that fell within that time window would have been placed on another channel. One skilled in the art would have been motivated to have done so in order to accommodate the timing issues observed by Dugan.

Regarding applicant's **Issue 3**, the applicant argues that the combination of Dugan, Hait, and Chang fails to specifically teach permuting the recurring time windows allocated to the channels, such that data content carried in the transmitted optical output signal occurs in a different sequence from the data content provided in the data signal. However, it is clear that the combination of references would have suggested this limitation in that Dugan teaches division of

the data stream, Hait teaches the use of recurring time windows to gather bits that fall within the time window, while Chang teaches that secure communication can be achieved by assigning packets (e.g. a plurality of data bits much like those gathered by Hait within the recurring time windows) onto randomly selected different wavelengths on a packet-by-packet basis, thereby ensuring that the output signal occurs in a sequence different from the data content provided in the data signal. For example, if the OC-192 signal of Dugan were partitioned according to the recurring time window method of Hait to form the smaller OC-48 signals of Dugan, one skilled in the art could have then used the method of Chang to secure the communication. The packets that fell within the windows of Hait and assigned randomly to the channels of Dugan according to the method of Chang would have resulted in an output at the multiplexer of Dugan that would have had a sequence different from the sequence of the original OC-192 signal of Dugan.

Regarding applicant's **Issue 4**, the applicant argues that the combination of Dugan and Norte I fails to specifically teach

a) providing optical radiation at two or more wavelengths to be refereed to as coding wavelengths, and

b) mixing a respective portion of the data signal with optical radiation at each of the coding wavelengths in a nonlinear optical device, thereby to generate modulated radiation having a wavelength different from the wavelength λ_D and the coding wavelengths.

However, it should be noted that according the applicant's specification and figures, these limitations are achieved via the use of a saturable optical filter, as seen in Figure 4. Norte I also teaches providing optical radiation at two or more wavelengths to be refereed to as coding

wavelengths (e.g. wavelengths at 1535, 1537, 1540, and 1541nm) and the use of nonlinear optical device to shift the wavelengths of the signals input (Figure 1(b)). It is clear that if the applicant has the ability to mix optical radiation with a data signal in a nonlinear optical device (e.g. saturable optical absorber) and produce modulated radiation having a wavelength different from the wavelength λ_D and the coding wavelengths, the it is also possible for one skilled to have produced the same results with the system of Norte I, being that Norte I also teaches mixing optical radiation with a data signal in a nonlinear optical device (Figure 1(b)).

Regarding applicant's **Issue 5**, the applicant argues that the combination of Dugan, Hait, Chang and Norte I fails to specifically teach the limitations relating to recurring time windows and the non-linear mixing operation of claim 10. However, as discussed above, the combination of Dugan and Hait teach assignment of data according to recurring time windows, Norte teaches that the optical radiation at each of the coding wavelengths is provided in the form of train pulses (see Figure 1(b)), the combination of Dugan Hait and Norte would have suggested that each of train pulses corresponds to a recurring time window allocated to one of the channels, and Norte, by virtue of teaching the same elements as the applicant (e.g. nonlinear mixing element SOA), teaches that the respective wavelength associated with each of the channels is a wavelength of modulated radiation generated by non-linear mixing.

Regarding applicant's **Issue 6**, the applicant argues that the combination of Dugan and Norte II fails to specifically teach the limitations of claims 21 and 32. The applicant also states that Dugan is deficient in meeting the limitations of claims 15 and 22. However, as stated above the

Dugan and the combination of Dugan and Hait clearly meet the limitations of the claims 15 and 22, respectively. Therefore, as stated above, Dugan and combination of Dugan and Hait are not deficient, and meet the limitation of the claimed invention. Furthermore, as stated in the previous office action, the combination of Dugan and Norte II meet the limitations of claims 21 and 32. Regarding claim 21, Dugan teaches optically demultiplexing the received signal, Norte II teaches shifting each single-channel signal into a wavelength channel by non-linear optical mixing, and Dugan teaches assembling the signals. Regarding claim 32, Dugan teaches demultiplexing Norte teaches shifting the wavelengths via non-linear devices, and Dugan teaches assembling the signals.

Regarding applicant's **Issue 7**, the applicant argues that since claim 26 depends from claim 22 it is allowable for the reasons identified with regard to claim 22. However, as stated above, the combination of Dugan, Hait, and NorteI teach the limitations of claim 22.

For the above reasons, it is believed that the rejections should be sustained.
AB
April 7, 2003

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